

***INCREASE project: a new approach to improve conservation, characterization, and use of food legume genetic resources***

***Proyecto INCREASE: un nuevo enfoque para mejorar la conservación, caracterización y uso de los recursos genéticos de las leguminosas alimentarias***



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Plant genetic resources play a crucial role in facing all the agriculture-related societal challenges, including climate change mitigation, sustainable agriculture, biodiversity conservation, food quality and security. The transition to plant-based diets could present major opportunities for adaptation and mitigation, as well as generate significant co-benefits for human health. In this context, food legumes are key crops being a very good source of proteins, as alternative to meat, and of other high quality nutritional compounds for human diets and, at the same time, being able to improve soil quality by nitrogen fixation through symbiosis with Rhizobia. INCREASE is a six-year project funded by the European Union's Horizon 2020 research and innovation program aimed to characterise, maintain and exploit food-legume genetic resources, to date largely unexploited, as the core development of both sustainable agriculture and a healthy food system. The focus is on four important food legumes (chickpea, common bean, lentil, lupin). INCREASE's activities are based on four pillars: i) innovative data management solutions to develop gold standards for data sharing and integration into the central infrastructure, with decentralised data input, defined methodologies and best practices to exploit the novel information produced as well as the development of user-friendly visualization tools; ii) developing novel tools and principles for germplasm management, based on the development of "Intelligent Collections" as a set of nested core collections of different sizes representing the entire diversity of each crop; iii) adoption of cutting-edge technologies for genotyping and phenotyping combined with the potential of Artificial Intelligence focusing on traits of interest for users; iv) carrying out a citizen-science experiment, primarily aimed at dissemination of the project to stakeholders and citizens. Overall, INCREASE is aimed to strengthen the field of food legumes genetic resources and simultaneously it will represent an important model and tool for all crop genetic resources.

**Key words:** Genetic Resources, Legume crops, Intelligent Collections, Artificial Intelligence.

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